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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,327	08/26/2003	Paul A. Knight	ISOT-017	4588

7590

02/09/2005

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EXAMINER

ZEC, FILIP

ART UNIT

PAPER NUMBER

3744

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/649,327

Applicant(s)

KNIGHT, PAUL A.

Examiner

Filip Zec

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/9/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 10, 11 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,907,473 to Przilas et al. In FIG. 2, Przilas teaches a spray coolant reservoir system comprising a chassis (100), having a spray chamber (22), a spray unit (54, 53) within said chamber for dispensing pressurized (50) coolant (36) upon an item (32) to be thermally managed, a coolant system (44) fluidly connected to said spray unit and said spray chamber providing the pressurized coolant to said spray unit, a reservoir (46) fluidly connected to said coolant system, said reservoir capable of storing a volume of coolant, a control system (120, FIG. 3A) in communication with said coolant system and said reservoir for controlling a flow of coolant between said reservoir and said coolant system (col 6, lines 29-35). Looking at the bottom of FIG. 1, one notices a tube (44) coming from the bottom of spray chamber (22), which bypasses the reservoir (46) and goes directly to the spray unit (53), after being pumped (50), providing for the first coolant flow. The rest of the piping (44) goes into the reservoir and then proceeds into the pump, providing for the second coolant flow, as claimed by the applicant. Said reservoir can be positioned external of or within said chassis (col 6, lines 49-52).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-7, 9, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,907,473 to Przilas et al. Przilas discloses applicant's basic inventive concept, a spray coolant reservoir system and a method for operating said system, substantially as claimed with the exception of specifically stating the use of a chamber port for a pressure equalization, fluidly connecting the spray chamber and the reservoir and the use of an intake valve, fluidly connected to the spray chamber and to the reservoir, and an output valve, fluidly connected to the spray unit and to the reservoir, where the valving system allows the coolant collected from the spray chamber to be entirely recycled, used jointly by the refrigerant from the reservoir or returned to the reservoir. Przilas, however, teaches the use of sensors (47, FIG. 3B), valves and relays, ..., to ensure the effective operation of the spraying system is independent of orientation due to gravity and/or externally applied "g" forces (col 6, lines 29-32). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Przilas, by adding an intake valve and an output valve in order to recirculate the coolant in the system or fill up the reservoir as needed. Przilas also teaches the use of a chamber port (24, FIG. 2) for pressure equalization, except that the port bypasses the reservoir and connects the spray chamber to the ambient air. Per claims 17 and 18, by having a chamber port (24, FIG. 2) open, the pressure in the system is controlled instantly and in a simpler manner than

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having two ports, one connecting the spray chamber to the reservoir, and another connecting the reservoir to the ambient air, as claimed by the applicant. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Przilas, by positioning the chamber port between the spray chamber and the reservoir in order to regulate the pressure relief when needed (col 4, lines 16-21).

5. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,907,473 to Przilas et al., in view of U.S. Patent 4,857,090 to Hartness. Przilas discloses applicant's basic inventive concept, a spray coolant reservoir system, substantially as claimed with the exception of specifically stating the use of an intake valve, fluidly connected to a spray chamber and a reservoir, which controls whether the coolant stored in the reservoir is added to the coolant collected from the bottom of the spray chamber and returned to the spray unit. Hartness shows an intake valve (52, FIG. 2), fluidly connected to a spray chamber (46) and a reservoir (48), which controls whether the coolant stored in the reservoir is added to the coolant collected from the bottom of the spray chamber (34) and returned to the spray unit (30) to be old in the refrigeration art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made from the teaching of Hartness to modify the system of Przilas, by adding an intake valve in order to control whether the coolant stored in the reservoir is added to the coolant collected from the bottom of the spray chamber and returned to the spray unit, thus reusing the coolant and being more cost efficient.

6. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,907,473 to Przilas et al., in view of U.S. Patent 4,476,687 to Conklin et al. Przilas discloses applicant's basic inventive concept, a spray coolant reservoir system, substantially as

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claimed with the exception of specifically stating that the output valve diverts coolant output flow to a reservoir to fill said reservoir. Conklin shows an output valve diverting a coolant output flow back to a reservoir (col 4, lines 40-43) to be old in the refrigeration art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made from the teaching of Conklin to modify the system of Przilas, by adding an output valve in order to control the refill of the tank (col 4, lines 53-55).

7. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,907,473 to Przilas et al., in view of U.S. Patent 6,305,180 to Miller et al. Przilas discloses applicant's basic inventive concept, a spray coolant reservoir system, substantially as claimed with the exception of stating the use of a fill port, a drain port and a vent port in the reservoir. Miller shows a fill port, a drain port and a vent port (col 6, lines 52-56) in the reservoir (piping array P, FIG. 3), to be old in the refrigeration art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made from the teaching of Miller to modify the system of Przilas, by adding a fill port to the reservoir in order to recharge the system with fresh coolant, a drain port to the reservoir in order to remove the old coolant when recharging and a vent port to the reservoir in order to manipulate the coolant pressure in the reservoir with respect to the ambient pressure.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 2,845,472 to Narbut, Paul teaches a transformer cooling apparatus.

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U.S. Patent 6,625,023 to Morrow, Ernest J. et al. teaches a modular spray cooling system for electronic components.

U.S. Patent 6,550,263 to Patel, Chandrakant D. et al. teaches a spray cooling system for a device.

U.S. Patent 6,055,824 to Kuma, Toshimi et al. teaches a method and device for refrigerating a fluid.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Filip Zec whose telephone number is (571) 272-4815. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Esquivel can be reached on (571) 272-4808. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Filip Zec
Examiner
Art Unit 3744


CHERYL TYLER
SUPERVISORY PATENT EXAMINER

FZ